Calavera Hills and Robertson Ranch Habitat Conservation Area

(S031)

Annual Work Plan
October 2007 - September 2008

Prepared for:
U.S. Fish and Wildlife Service
California Department of Fish and Game
City of Carlsbad

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I. INTRODUCTION AND SUMMARY

This work plan has been developed from the guidelines for goals and objectives set forth in the Calavera Hills Phase II Final Habitat Management Plan (HMP) dated October 2002 (Planning Systems 2002), and the Robertson Ranch East Village Open Space Land Management Plan (Planning Systems 2006). This annual work plan includes management requirements outlined in the Calavera Hills Phase II, and the Robertson Ranch East Village Open Space Land Management Plans (together referred to as HMPs), and as agreed to by the United States Fish and Wildlife Service (USFWS) and California Department of Fish and Game (CDFG).

The Center for Natural Lands Management (CNLM or the Center) holds conservation easements (since June of 2006 for Calavera Hills Phase II, and February 2007 for Robertson Ranch East Village) on the Calavera Hills and Robertson Ranch Habitat Conservation Area (HCA) and performs or oversees the tasks identified in the two Management Plans.

The Center has merged the funding and reporting for these two areas as we provided the developer (same for both properties) a financial discount for selecting CNLM to manage both properties. In other words, the funding for the Robertson Ranch areas is less than what we would normally charge had we not already received funding for the Calavera Hills Phase II areas. This will also simplify future budgetary, reporting, and planning considerations.

The purpose of this work plan is to identify the tasks and budget required to complete the management activities for the upcoming management year that will begin on October 1, 2007 and end on September 30, 2008. Unless otherwise stated, all tasks will be performed by CNLM's Area Manager, Markus Spiegelberg and CNLM's Preserve Managers, Patrick McConnell and Jessica Vinje.

Summary of Tasks and Goals for the 2007-2008 Fiscal Year:

- Maintain signs and existing fences
- Install smooth-wire fencing to limit pedestrian and vehicular access
- Conduct focused surveys for Coastal California gnatcatcher (*Polioptila californica californica*); record and map observations of other sensitive avian species
- Conduct focused surveys for San Diego horned lizard (*Phrynosoma coronatum blainvillii*) and Belding's orangethroat whiptail (*Cnemidophorus hyperythrus beldingi*)
- Continue native grassland habitat assessments at Village H
- Census and map thread-leaved brodiaea (*Brodiaea filifolia*) and other sensitive plants throughout the HCA
- Perform baseline surveys and cover estimates of vernal pool plants
- Set up and conduct coastal sage scrub (css) long-term monitoring plots
- Monitor and control nonnative, exotic plants
- Correct erosion control issues at Villages X and H
- Install and irrigate native plants at Village R
- Install pvc pipe extension on sub-drain outfall in Village X
- Continue developing participation of local schools in natural science education efforts

- Continue communications with the Calavera Hills and Robertson Ranch HCAs and homeowners regarding landscaping issues, and the mission of the Center
- Conduct weekly patrol visits
- Remove trash as necessary
- Report and describe data collected and management actions taken on the HCA to the wildlife agencies and City of Carlsbad
- Provide an accounting of funds to be spent in the fiscal year

Appendix 1 (*2007-2008 Task Schedule*) identifies the approximate schedule of tasks for the upcoming fiscal year. Appendix 2 (*Annual Budget 2007-2008*) provides a financial summary for both staff time and costs for the year. The location of the HCA is shown in Appendix 3. The HCA is comprised of six parcels, commonly referred to as Village H, R, U, W, and X, and Robertson Ranch East Village, which is bisected by College Avenue, and is essentially composed of two separate parcels (Appendix 3).

II. MANAGEMENT ACTIVITIES

The following sections identify and describe the activities to be performed during the upcoming management year. Based upon the Property Analysis Record (PAR) developed by CNLM to outline long-term management tasks and costs, management activities for the HCA can be categorized into seven groups: Capital Improvements, Biological Surveys, Habitat Restoration, Public Services, Reporting, Office Maintenance, and Operations. Each of these categories will be discussed below.

A. CAPITAL IMPROVEMENTS

The installation of signs and fences will occur during this fiscal year:

1. Signing CNLM signs will maintained at all of the major access points and along most of the perimeter to the HCA and a few other notable locations. Each sign explains that the HCA is a dedicated as a habitat preserve, and that fire, mechanized travel, dumping, and shooting are prohibited.

2. Fencing CNLM will support the installation of split-rail fencing along the planned City of Carlsbad Parks and Recreation trail that will run from the southern boundary of Village H toward the center, and out to the east. As the split-rail may not be sufficient in coverage, smooth wire fencing may be installed in order to dissuade people from entering the sensitive shrub and grassland sites farther north. We will install a small amount of fencing along both sides of a newly installed chain link gate at the boundary of Villages X and East Village parcels. There are several unwanted, redundant trails crossing Village U, and we will install some fencing along several points in order to discourage further usage. We will also install about 2800 feet of smooth wire along the eastern boundary of the East Village parcel, and an estimated 80 t-posts with smooth wire along the edge of the proposed restoration area in Village R.

B. BIOLOGICAL SURVEYS

Biological monitoring activities at the HCA will follow items listed in the HMPs. CNLM has modified monitoring tasks outlined in the HMPs to adjust the task time lines and some of the tasks which it finds to be unnecessary at this time. Below is a description of the tasks that will be accomplished during the upcoming fiscal year. In addition, Table 1 outlines all tasks that will be completed at the HCA and an associated time line for the next 5 years.

Table 1
Schedule of Biological Monitoring Tasks

Monitoring task	2007/2008	2009/2010	2010/2011	2011/2012	2012/2013
Focused sensitive reptile surveys[1]	X			X	
Coastal California gnatcatcher surveys (including observations of other sensitive avian species)	X	X	TBD	TBD	TBD
Avifauna point counts[2]	TBD	TBD	TBD	TBD	TBD
Native grassland vegetation community assessments	X	X			
Coastal sage scrub quantitative monitoring	X			X	
Thread-leaved brodiaea surveys	X	X	X	X	X
Other sensitive plant surveys	X				X
Vernal pool plant monitoring & assessment	X	TBD	TBD	TBD	TBD

1. Focused reptile surveys will occur in lieu of installing and monitoring pitfall arrays. Pitfall arrays will not be installed because the HCA is heavily used by the public. Based on CNLM experience, these arrays would likely be vandalized.

2. The management plan specifies that avian point counts should occur annually. The actual time line for annual point counts will be determined in the future.

Monitoring during the next year includes focused surveys for coastal California gnatcatcher, San Diego horned lizard, Belding's orangethroat whiptail, and sensitive plants; a characterization of the native grassland occurring in the HCA; and the first year of a long-term css monitoring program. All data will be entered or stored in a Geographic Information System (GIS) database, or in MS Excel. Brief descriptions of monitoring activities outlined by taxa are provided below:

1. **California Gnatcatcher & Avifauna Monitoring** We will conduct two to three focused surveys for coastal California gnatcatchers during the spring months and note other sensitive bird species as they are observed.

2. **Focused Reptile Surveys** We will conduct intensive foot surveys for direct and indirect evidence of San Diego coast horned lizard and Belding's ornangethroat whiptail throughout the preserve during the late spring and/or early summer of 2008. Direct evidence will be the actual sighting of animals, while indirect evidence will be scat or other markings evident of occupation or foraging. Locations of individuals or signs will be entered into a geographic positioning device.

3. **Vegetation Sampling**

   a. **Native grassland assessments** The native grassland areas of the HCA support sensitive species such as the thread-leaved brodiaea. CNLM will continue to assess the quality of this vegetation community to determine the cover and composition of native and nonnative plant species. Vegetation plots have been stratified throughout the grassland areas, and transects were placed within each plot. More detail of these activities will be provided in the annual report.

   b. **Coastal sage scrub long-term monitoring** Several long-term vegetation monitoring plots will be installed throughout the preserve as part of our objective to track changes in species cover, presence, and population attributes over time. More information about the justification for these plots, and the sampling design is provided in Appendix 4.

4. **Sensitive Plant Species** Surveys will occur for thread-leaved brodiaea in Village H. Additionally, Palmer's grappling hook (*Harpagonella palmeri*), western dichondra (*Dichondra occidentalis*), Nuttall's scrub oak (*Quercus dumosa*), and California adolphia (*Adolphia californica*) will be censused and mapped where found throughout the preserve during the 2006-2007 fiscal year. Other sensitive plants will be censused and mapped, if located.

5. **Vernal Pool Monitoring** Two artificial road-rut depression vernal pools were identified in the East Village parcel during initial project monitoring by Merkel and Associates in 2002. Botanical surveys will be conducted to determine a baseline species list, and estimates of percent cover by species will be taken. The presence or absence of Branchiopods (fairy shrimp) will also be noted.

   The pools will be also assessed for exposure to excess runoff from upslope development irrigation. If nonnative plants appear to pose a problem with the long-term functioning of the pools, hand-weeding, or a less invasive method of

weed treatment (i.e., cutting of seed-heads) will be carried out if pulling weeds appears to damage soil structure.

C. HABITAT RESTORATION AND MAINTENANCE

Most of the HCA's habitat is good quality, with little disturbance from nonnative species. There are nonnative exotic plants scattered throughout the HCA, however. CNLM has budgeted for continuing the eradication efforts in Village H.

1. **Village H weeds:** Fennel (*Foeniculum vulgare*), and crown daisy (*Chrysanthemum coronarium*) patches will continue to receive treatments in an attempt to eradicate these species from the preserve. Since 2006, the southern end of Village H has been periodically mowed and boom-sprayed in order to reduce the seed production of this persistent weed. Three critically timed mowings will occur during 2008 in order to continue the eradication effort. Fennel has been largely reduced throughout Village H since the contracted treatments of 2006. Follow-up will take place in this area in the spring of 2008 with the aid of contracted herbicide applicators. Boom spraying of herbicide will continue as needed among fennel and chrysanthemum populations. Budget allowing, we will expand the area of weed control down-hill along the eastern edge of this chrysanthemum-dominated area to control fennel and black mustard (*Brassica nigra*).

2. **Village R restoration:** Village R is the among the most disturbed of our parcels, and thus holds much promise for habitat enhancement activities. Appendix 5 contains a close-up of the area of Village R most in need of restoration. The site outlined is to receive continued weed treatments through the spring and summer of 2008, followed by native grassland species planting in late summer 2008. We have budgeted for the planting, weeding activities, and irrigation of 600 native grass plugs in this location.

3. **Village X Water Deposition:** The Ravinia development created a sub-drain outfall that drains onto the eastern edge of Village X. This has created an area of emergent wetland vegetation in an area previously holding css. We have initiated discussions with Mcmillan Land Development Inc. to get approval for connecting to the current outfall pvc, and continuing a pvc drainage the entire distance to the ravine in the middle of Village X. We have budgeted for the addition of approximately 300 feet of 4-inch pvc piping for the 2007-8 fiscal year, and are currently awaiting approval by McMillan and HOA representatives.

4. **Village H and X Erosion Control:** The silty-clay soils of these two sites appear to be eroding due to the increased surface run-off from neighboring properties. The main stream channels in Village H and X, as well as some side channels are deeply incised, and in need of check-dams. We have budgeted for the addition of

500 gravel bags and two four-person contractor work days to slow, or reverse, this process. This work will likely take place in late 2007, or early 2008.

D. PUBLIC SERVICES

Public services activities include the patrolling of the HCA; consulting with neighbors, HOA representatives, and landscapers about perimeter landscaping; and responding to emergencies. However, other opportunities for public service will undoubtedly be forthcoming during the year with local groups and individuals interested in volunteering labor for HCA projects, and class field trips from local schools. Whenever possible, management will try to accommodate these activities.

1. **Educational Outreach** The Center has cooperated with Merle O'Niell of the Carlsbad Unified School District in the design of a field studies program using our preserve as a classroom. Several ideas have been discussed which may lead to curricula that will generate increased understanding among the students about the aesthetic and practical values of preserving habitat. In 2007-2008, we will continue efforts to expand the field studies into meaningful data-driven explorations that link ecosystem conditions to the welfare of local citizens.

2. **Homeowner Outreach** The landscaping bordering the preserve is typically high-water use. The result of this hydrophilic vegetation is excess water seepage into our preserve edges, which will replace dry-adapted vegetation with wetland vegetation. The Center has initiated meetings with landscaping contractors and HOA representatives regarding this matter, and has submitted HOA newsletter articles in an attempt to enlist the sympathy of homeowners. In 2007-2008 we will make every effort to resolve this issue by continuing contractor, homeowner, and HOA management outreach.

3. **Patrols** Patrols will be performed approximately four times per month, and also during biological surveys or other HCA activities. Patrols include the routine maintenance of fences and signs and trash pick up. Observations of sensitive species, new human impacts, new weed infestations, and trash will be gathered during patrols as well.

4. **Emergency Response** Staff time has been allocated from the current budget for response to emergencies on the HCA. Such emergencies could include response to wildfires, wildlife problems reported by neighbors, and illegal trespass.

E. REPORTING

Reporting requirements include the management of the HCA's database/GIS system, the photo-documentation stations, and the production of various status reports to the City of Carlsbad, USFWS, CDFG, and CNLM administration.

1. **Database/GIS Management** Data derived from routine patrols and photo-documentation will be entered into and maintained in the HCA's existing database/GIS system. Additional databases will be established for the various biotic monitoring programs including the production of historical and current vegetation maps. Efforts will be made to coordinate and standardize database fields and parameters with other preserves.

2. **Photo-documentation Stations** Permanent photo-documentation stations were established for the Calavera properties in 2006 and photographs were labeled and stored. Photographs at these stations will be updated in 2009. Baseline photo points were also established for Robertson Ranch East Village parcels in the spring of 2007, along the preserve edges. These photo-points will be updated in the spring of 2008 and in subsequent years, depending upon whether the excess water problems are dealt with adequately.

3. **Reports**

   a. **Year-End/Agency Reports** A year-end report will be prepared by the preserve manager by December of 2008 detailing the results of the year's management activities. This report will include recommendations for the continuation of various activities for the following fiscal year and will be submitted to the City of Carlsbad, USFWS, and CDFG, as required under permit reporting conditions.

   b. **Annual Work Plan** The annual work plan for the 2008-2009 fiscal year will be formulated by the end of the 2007-2008 fiscal year and will be based upon experiences during previous years' operations. This work plan will be submitted to the City of Carlsbad and USFWS and CDFG.

F. OFFICE MAINTENANCE

Preserve management will maintain offices in an organized manner to facilitate maximum efficiency. This section of the budget includes outlays for general office work, utilities, and telephones, among other items/tasks.

G. OPERATIONS

Operations include the training and professional growth of CNLM personnel, and inspection of the HCA by CNLM administration. Funds have been allocated in the current budget for the Preserve Managers to attend classes or seminars during the upcoming year. Also included within this category of activity is the conduct of employee reviews.

III. WORKLOAD AND BUDGETS

1. **Supervision and Staffing:** The Area Manger will be supervised by CNLM's Director of Conservation Science, Deborah Rogers. Tasks and hours will be coordinated by the Area

Manager and approved by Ms. Rogers. The Area Manager, Markus Spiegelberg, will supervise the Preserve Managers, Jessica Vinje and Patrick McConnell.

2. **Budgeting**: A budget of $70,844 has been allocated for this fiscal year and is included here as Appendix 2. Every effort will be made by Preserve Management to allocate time and expenses according to this estimated budget.

IV. REFERENCES

Planning Systems. 2002**.** Calavera Hills Phase II Final Habitat Management Plan. October 2002.

Planning Systems. 2006. Robertson Ranch East Village Open Space Land Management Plan. November 2006.

IV. APPENDICES

Appendix 1
2007-2008 Task Schedule

Task	October-December 2007	January-March 2008	April to June 2008	July to September 2008
Nonnative Plant Removal	X	X	X	X
Coastal California Gnatcatcher Surveys		X	X	
Focused Sensitive Reptile Surveys				X
Native Grassland Assessments			X	
Sensitive Plant Surveys		X	X	
Coastal Sage Scrub Monitoring			X	
GIS/Database			X	
Village R Restoration				X
Village X Water Diversion			X	
Village X, H Erosion Control	X			
Fencing/Signage	X	X	X	X
Patrolling	X	X	X	X
Reports				X
Public Outreach	X	X	X	
Vernal Pool Plant Monitoring			X	

Appendix 2
Annual Budget 2007-2008

Section 8 - Initial & Capital Tasks and Costs

Property Title: Calavera Hills | Dataset: CA005 | PAR ID: S031V08 | 10/16/2007

Budget: Annual Budget 2007-8

Task list	Specificaton	Unit	Number of Units	Cost / Unit	Annual Cost	Times Years	Total Cost
SITE CONSTRUCTION/MAINT.							
Project Planning	Supervise/coordinate MS	L. Hours	4.00	40.55	162.20	1.0	162.20
Fence - Installed	Smooth wire, 9 guage	Rolls	6.00	75.00	450.00	1.0	450.00
Fence - Installed	T-posts Rob Ranch East Vill.	Item	100.00	3.00	300.00	1.0	300.00
Fence - Installed	T-posts Calavera Vill. X	Item	80.00	3.00	240.00	1.0	240.00
Fence - Installed	Fencing clips	Item	10.00	1.80	18.00	1.0	18.00
Fence - Installed	Other materials	Item	1.00	150.00	150.00	1.0	150.00
Fence - Installed	Supervise/install fencing PM	L. Hours	32.00	27.32	874.24	1.0	874.24
Fence - Installed	Fencing labor	C. Hours	32.00	31.00	992.00	1.0	992.00
Gate	Maintenance supplies	Item	0.80	334.67	267.74	1.0	267.74
Lock	Padlock	Item	4.00	21.20	84.80	1.0	84.80
Sub-Total							3,538.98
BIOTIC SURVEYS							
Project Management	Supervise/coordinate MS	L. Hours	4.00	40.55	162.20	1.0	162.20
Plant Ecologist	Sensitive plants PM	L. Hours	32.00	27.32	874.24	1.0	874.24
Plant Ecologist	Research PM	L. Hours	24.00	27.32	655.68	1.0	655.68
Plant Ecologist	Grassland assessment	C. Hours	10.00	15.00	150.00	1.0	150.00
Plant Ecologist	Grassland assessment PM	L. Hours	14.00	27.32	382.48	1.0	382.48
Plant Ecologist	Veg mon. setup and read PM	L. Hours	26.00	27.32	710.32	1.0	710.32
Plant Ecologist	Veg mon. setup and read MS	L. Hours	26.00	40.55	1,054.30	1.0	1,054.30
Ornithologist	CAGN surveys MS	L. Hours	20.00	40.55	811.00	1.0	811.00
Science Director	Planning and Review	L. Hours	20.00	50.00	1,000.00	1.0	1,000.00
Sub-Total							5,800.22
HABITAT RESTORATION							
Plant Procurement	Native Grasses Village R	Dee Pot	600.00	0.85	510.00	1.0	510.00
Plant Protection Device	Plant protectors Village R	Item	200.00	2.50	500.00	1.0	500.00
Irrigation System	Installation PM	L. Hours	28.00	27.32	764.96	1.0	764.96
Irrigation System	Installation JV	L. Hours	16.00	32.48	519.68	1.0	519.68
Irrigation System	Maintenance, Labor PM	L. Hours	12.00	27.32	327.84	1.0	327.84
Sub-Total							2,622.48
HABITAT MAINTENANCE							
Erosion Control	Sand bags Vill. H, X	Item	500.00	1.00	500.00	1.0	500.00
Erosion Control	RECON erosion ctrl Villag H	C. Hours	40.00	32.00	1,280.00	1.0	1,280.00
Erosion Control	RECON erosion ctrl Villag X	C Hours	40.00	32.00	1,280.00	1.0	1,280.00
Exotic Plant Control	RECON spray East Village	C. Hours	80.00	32.00	2,560.00	1.0	2,560.00
Exotic Plant Control	RECON spray Village X	C. Hours	80.00	32.00	2,560.00	1.0	2,560.00
Exotic Plant Control	RECON fennel Village H	C. Hours	32.00	29.00	928.00	1.0	928.00
Exotic Plant Control	RECON other weed control	C. Hours	40.00	32.00	1,280.00	1.0	1,280.00
Exotic Plant Control	Herbicide	Gal.	3.00	60.00	180.00	1.0	180.00
Exotic Plant Control	Supervise/removal PM	L. Hours	80.00	27.32	2,185.60	1.0	2,185.60
Mower, Tractor	RECON Boom Spray in	C. Hours	8.00	70.00	560.00	1.0	560.00
Mower, Tractor	Boom Spray use fee	Item	1.00	250.00	250.00	1.0	250.00
Mower, Tractor	Mowing Village H	Item	3.00	90.00	270.00	1.0	270.00

Task list	Specificaton	Unit	Number of Units	Cost / Unit	Annual Cost	Times Years	Total Cost
Sub-Total							13,833.60
WATER MANAGEMENT							
Water Control	Drain off-site water PM	L. Hours	12.00	27.32	327.84	1.0	327.84
Water Control	Materials and delivery	Item	1.00	527.42	527.42	1.0	527.42
Sub-Total							855.26
PUBLIC SERVICES							
Patrolling	Patrol MS	L. Hours	40.00	40.55	1,622.00	1.0	1,622.00
Patrolling	Patrol JV	L. Hours	40.00	32.48	1,299.20	1.0	1,299.20
Patrolling	Patrol PM	L. Hours	80.00	27.32	2,185.60	1.0	2,185.60
Trail	Eagle Project	Item	1.00	500.00	500.00	1.0	500.00
Sign, Aluminum	Posts	Item	6.00	18.00	108.00	1.0	108.00
Interpretive Literature	Copy	Page	500.00	0.12	60.00	1.0	60.00
Community Outreach	Volunteer coordination PM	L. Hours	16.00	27.32	437.12	1.0	437.12
Sub-Total							6,211.92
GENERAL MAINTENANCE							
Other	Dump Fees	Each	1.00	50.00	50.00	1.0	50.00
Sub-Total							50.00
REPORTING							
Database Management	Data Input PM	L. Hours	8.00	27.32	218.56	1.0	218.56
GIS/CAD Management	Data Management PM	L. Hours	24.00	27.32	655.68	1.0	655.68
GIS/CAD Management	Cadre	Item	4.00	65.00	260.00	1.0	260.00
Annual Work Plan	Plan and PAR Budget PM	L. Hours	8.00	27.32	218.56	1.0	218.56
Annual Work Plan	Plan and PAR Budget MS	L. Hours	8.00	40.55	324.40	1.0	324.40
Agency Report	Annual Report PM	L. Hours	24.00	27.32	655.68	1.0	655.68
Agency Report	Annual Report MS	L. Hours	8.00	40.55	324.40	1.0	324.40
Other	CE compliance	L. Hours	8.00	40.55	324.40	1.0	324.40
Sub-Total							2,981.68
OFFICE MAINTENANCE							
Administrative	Operations MS	L. Hours	30.00	40.55	1,216.50	1.0	1,216.50
Administrative	Operations JV	L. Hours	10.00	32.48	324.80	1.0	324.80
Administrative	Operations PM	L. Hours	40.00	27.32	1,092.80	1.0	1,092.80
Preserve Office	Rent	Year	0.15	5,115.00	767.25	1.0	767.25
Telephone Charges, Annual	Phone Charges	Year	0.15	3,300.00	495.00	1.0	495.00
Office Supplies, Year	Supplies	Person	0.15	2,500.00	375.00	1.0	375.00
Computer, PC & Monitor	Computers and peripherals	Item	0.20	2,000.00	400.00	1.0	400.00
Sub-Total							4,671.35

Task list	Specificaton	Unit	Number of Units	Cost / Unit	Annual Cost	Times Years	Total Cost
FIELD EQUIPMENT							
Surveying Equip.	Hand-held data coll. device	Item	1.00	300.00	300.00	1.0	300.00
Vehicle	Mileage	Mile	5,200.00	1.18	6,136.00	1.0	6,136.00
Power Tools	Misc. Tools	Item	0.27	500.00	135.00	1.0	135.00
Uniforms	Specification Unif. Allowance	Item	0.30	61.35	18.41	1.0	18.41
Sub-Total							6,589.41
OPERATIONS							
Audit	CPA Audit	Item	0.15	3,043.00	456.45	1.0	456.45
Insurance	General	Fee	1.00	348.84	348.84	1.0	348.84
Employee Training	Retreat expense	Item	0.15	1,485.00	222.75	1.0	222.75
Employee Training	Retreat and Conferences MS	L. Hours	6.00	40.55	243.30	1.0	243.30
Employee Training	Retreat and Conferences JV	L. Hours	8.00	32.48	259.84	1.0	259.84
Employee Training	Retreat and Conferences PM	L. Hours	8.00	27.32	218.56	1.0	218.56
Conferences	Conferences	Item	0.15	500.00	75.00	1.0	75.00
Other	Vacation, sick MS	L. Hours	32.00	40.55	1,297.60	1.0	1,297.60
Other	Vacation, sick JV	L. Hours	29.00	32.48	941.92	1.0	941.92
Other	Vacation, sick PM	L. Hours	25.00	27.32	683.00	1.0	683.00
Other	BioOne	Item	0.15	245.00	36.75	1.0	36.75
Sub-Total							4,784.01
CONTINGENCY & ADMINISTRATION							
Contingency							5,193.89
Administration							13,711.87
Sub-Total							18,905.76
Total							70,844.67

Appendix 3
HCA Location Maps

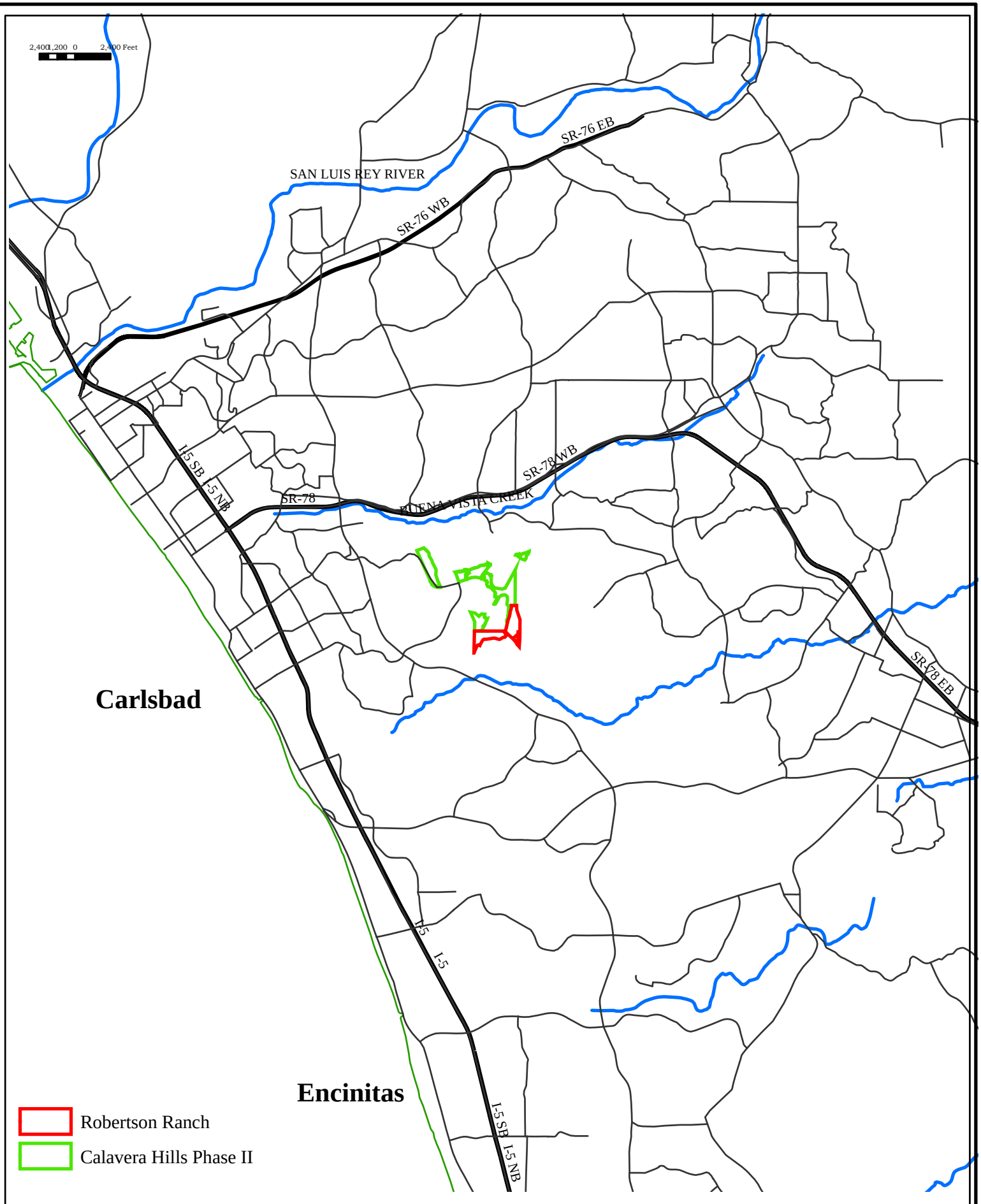

Figure 1
Preserve Vicinity
Roberstson Ranch and Calavera Hills Phase II Habitat Conservation Area - Carlsbad, CA

Center for Natural Lands Management

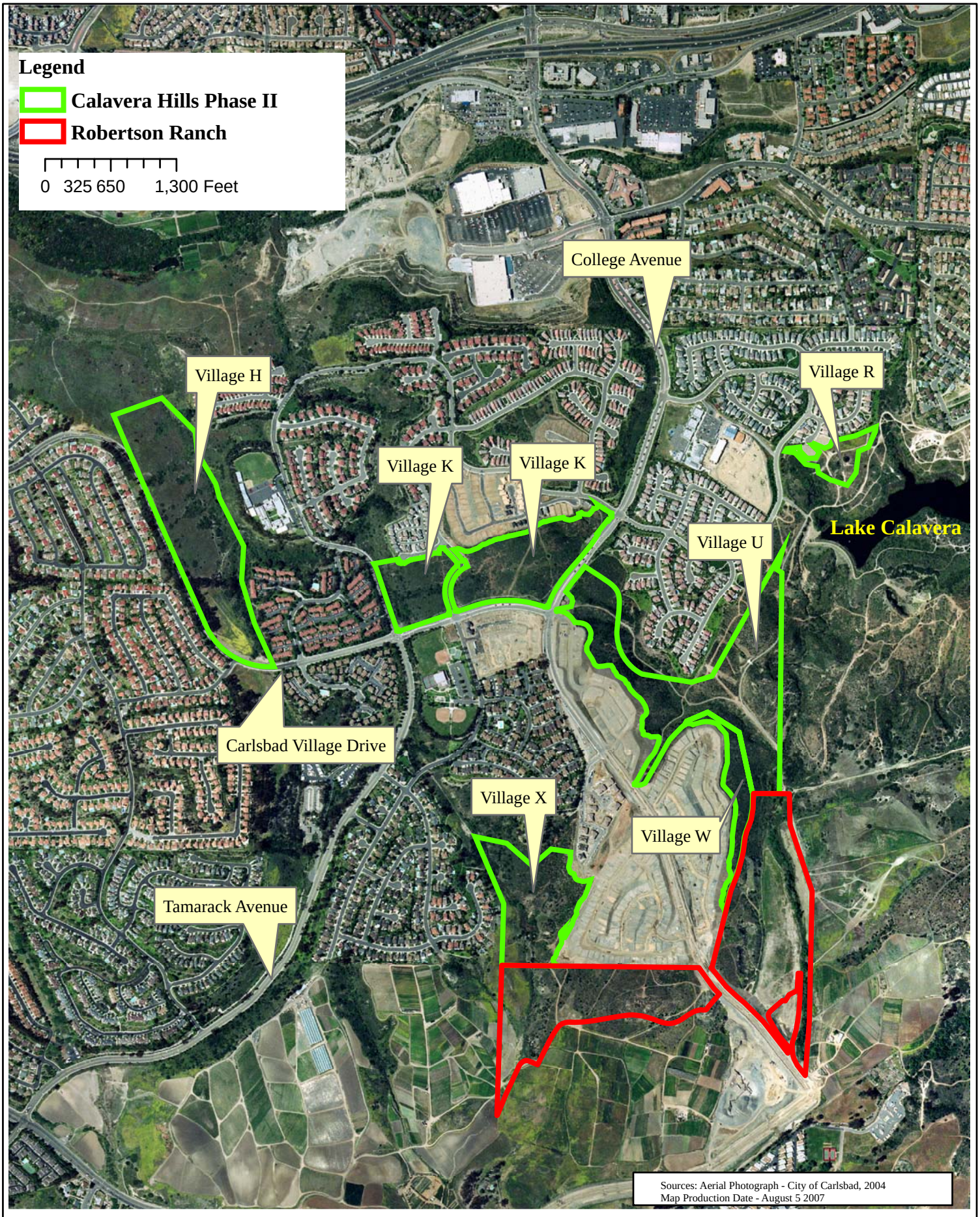

Figure 2
Preserve Location Map
Calavera Hills Phase II and Roberston Ranch - Carlsbad, CA

Center for Natural Lands Management

Appendix 4
Coastal Sage Scrub Long-Term Monitoring Plan

The Center for Natural Lands Management-San Diego: Coastal Sage Scrub Monitoring Plan

Objective: Track the changes in structure and composition of the coastal sage scrub (CSS) community.

a. Use data to evaluate the structure and composition of the CSS vegetation community and its correlation to predictions of vegetation changes based on theories postulated by ecological and threats models.
b. Use data to evaluate changes or trends in "populations", presence/absence and/or occupied/unoccupied habitat of sensitive animal species, primarily the coastal California gnatcatcher (*Polioptila californica californica*)(CAGN).
c. Use data to evaluate changes in plant diversity.
d. Use data to evaluate changes over time from a baseline vegetation pattern.
e. Use data to guide vegetation management decisions (i.e. nonnative plant removal, rare species. range increases/introductions).

Background of Need:

The Center for Natural Lands Management (CNLM) manages several thousand acres of CSS in San Diego County. These areas host several threatened, endangered and sensitive plant and wildlife species, provide key locations for wildlife movement and are some of the last remaining stands of CSS in coastal San Diego. These areas were also specifically designated as important areas to conserve as part of regional Habitat Conservation Planning (HCP) conservation efforts.

As a result, the CNLM needs to be able to evaluate recruitment and vigor of this vegetation community over time to guide management decisions and to evaluate changes in plant and animal communities. This monitoring will also provide an opportunity to evaluate theorized predictions of changes in vegetation communities resulting from urbanization, nonnative species invasion, global warming, increased edge, altered fire regime and fragmentation (to name a few).

Background of Ecological Model and Threats

CSS is a fire-adapted vegetation community with fires occurring naturally, but most severely under the extreme Santa Ana heat and winds of late summer and fall and during drought conditions. During these conditions there would generally be a "complete burn" where all above ground vegetation within the fire's path would be consumed. After such a fire, herbaceous plants (fire followers), which are known to sprout after fires, would dominate the landscape for a few years. Over time (3-5 years) the shrub lands would regain their dominance, and after 5-10 years a mature assemblage of plants and wildlife would again be found on site (Dallman 1998).

The fire frequency in CSS is as frequent as chaparral due to the volatile oils and resins that occur in CSS plants. The plants, such as white sagebrush (*Saliva apiana*), are able to resprout after a fire or produce many seedlings from the dormant seed bank that lies in the soil. Seed germination of some species may also be stimulated by fire (Holland and Keil 1995, Dallman

1998). However, if the fire frequency and intensity are too great, plants in the CSS community, such as black sage (*Salvia mellifera*) and California sagebrush (*Artemisia californica*) are permanently killed and can no longer regenerate, slowly converting the CSS community to a nonnative, annual grassland (Southwest Division, Naval Facilities Engineering Command 1998).

Each CNLM preserve in San Diego has a different fire history and a different predicted fire future. For example, most of the Rancho La Costa (RLC) Habitat Conservation Area (HCA) burned in the Harmony Grove fire in October of 1996, while the Manchester HCA has not burned (except two very small fires) in its entirety since 1917. Prior to 1917 no data are recorded, so it is uncertain as to when the last significant fire event occurred in the Manchester HCA.

Regardless of fire history and the current vegetation characteristics, there are many realized or potential threats to the integrity of the CSS vegetation community (See RLC Habitat Management Plan CSS Ecological Model and Threats Section) that need to be evaluated:

1. What is the effect of the altered fire regime at each HCA?
2. What is the potential effect of global climate change?
3. What are the effects of urban edge?
4. What are the effects of fragmentation and isolation?
5. What are the effects of altered wildlife usage patterns?

These threats questions lead to other questions associated with their effect on ecological processes and patterns:

1. Are the variables investigated representing a threat?
2. At what spatial scale are the variables representing a threat?
3. How do the effects of the threats listed above effect the distribution and abundance of sensitive plant and wildlife species?
4. How do the threats listed above effect the distribution of non-sensitive plants and animals?
5. How do the effects of each threat alter ecological processes?
6. How do the various measured factors interact?

Predictions

Fire. We predict that as a result of fragmentation, complete burns of preserves are now less likely and there will be fewer, smaller fires resulting in a mosaic of CSS with various age structures.

Global Climate Change. We predict that rainfall patterns will change (likely decrease) over the next 100 years resulting in a lengthening of the fire season, frequency of lightening fires, frequency of drought, and areas burned. We predict:

1. Possible regime shifts (altered abundance and recruitment patterns in various native vegetation assemblages)

2. Altered invasion severity of exotic species due to changes from native-adapted variations in weather phenomena
3. Lowered seedling survival of species due to changes from native-adapted variations in weather phenomena
4. Lowered seed and/or clonal production of future generations due to changes from native-adapted variations in weather phenomena
5. Negative interactions between native wildlife and changes resulting from the above mentioned predictions in vegetative cover

Habitat Fragmentation and Urban Edge. We predict that habitat fragmentation will reduce plant diversity and migration and/or genetic exchange between plant populations. This could affect the CSS community by reducing vigor within populations and eventually leading to extinctions of specific plant species.. Habitat fragmentation has resulted in an increase of urban edge on all our preserves. We predict that this will result in increased pressures from nonnative plant species, illegal vegetation clearing, dumping, erosion, and other threats that will change the vegetation structure and composition.

Monitoring Methodology

Approximately fifty plots will be established inside three of our preserves, and the number per preserve allocated by the amount of acreage currently occupied by CSS in each preserve. These plots will be placed in a stratified random manner across our preserves. Stratification will take into account:

1. Size of preserve (or size of parcel?)
2. Slope and aspect
3. Distance from preserve edge/urban edge
4. Presence or absence of CAGN or San Diego horned lizard (*Phrynosoma coronatum blainvillii*)
5. Fire history

Plot Design and Setup

The plot design will be of a modified Whittaker nested vegetation sampling design as in Stohlgren et al. 1995. The dimensions of the macroplot will be 50 meters long by 20 meters wide. Three smaller nested plots will be placed inside the macroplot. The larger of these three is to be 20 meters long and 5 meters wide, placed in the center of the macroplot, with the long axis corresponding to that of the macroplot. The two other nested plots will be at opposite corners of the macroplot, and will be 5 by 2 meters in length, again with the long axis corresponding to that of the macroplot. The design of the modified Whittaker plot we are using deviates from that described in Stohlgren et al. 1995 by not including the 12 smaller 1- square meter rectangles. The long axis of the modified Whittaker plots will be set to cross the environmental gradient present. Sampling will be carried out for both continuous variables (percent cover by species, perennial species height), non-parametric and semi-continuous variables (count of shrub seedlings, species presence).

Point Intercept Data

Percent cover by species will be gathered by running a point-intercept transect along one or both long borders of the macroplots. In addition to species cover, height measurements will be collected for all perennial species measured as a "hit" along the transects. The point-intercept transects will be measured at half meter intervals, thus generating 98 "hits" along one or each long side of the macroplot. Living plants will count as a point or "hit," if a 1.5 millimeter dowel is intersected in the vertical plane by the living tissue of a plant. At each half meter, data pertaining to bare ground, rock, or litter incident with the dowel will also be collected.

Species Diversity, Recruitment and Mortality

Information gathered inside the plots will include species present in each plot, including the macroplotwhole plot. In the two small plots, and in the large central plot, counts of shrub seedlings by species will be documented.

Rational for a Two-Tiered Approach

The data collected in the macroplot, and smaller sub-plots will be useful in generating species area curves and (more importantly) in documenting species presence or absence, as well as recruitment and mortality over time. The advantages of using a multi-scaled approach to quantifying species richness are identified in Stohlgren et al. 1995. As the years progress, small changes in species presence or seedling recruitment may be observed as disappearances, appearances, increases, or decreases on the micro-scale of sub-plot. The appearance of nonnative species may be quickly identified on the macroplotscale, while the disappearance, or lack of recruitment among native shrubs may be apparent on the smaller plot scale prior to any notice of change on the macroplotscale. Another advantage of using smaller nested plots is that it provides an affordable estimate of shrub recruitment and mortality, since attempting to quantify these measures would be very labor-intensive if carried out on the macroplotscale.

The point-intercept transect measures will provide a method of quantifying change in abundance by species that may provide clues that tie into changes in recruitment or mortality among the sub-plot counts and diversity estimates. For instance, nonnative grasses and/or litter cover changes may be predictive as explanatory variables in a multi-factorial analysis of the response variables mortality or species number decline. Other variables that may be tied into a model explaining the measured pattern may include regional rainfall totals for the season and/or seasonal temperature averages, slope and aspect of plots, fire history, and the presence or absence of animal herbivory.

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Appendix 5
Village R Restoration Area

Village R Restoration Area

Calavera Hills Phase II and Roberston Ranch - Carlsbad, CA

Center for Natural Lands Management